Skin prick testing: guidelines for GPs

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Requesting a skin prick test

From 1st October 2016 skin prick test requests will only be accepted if written on Labtests specific Skin Sensitivity Referral form. All details in the referral section must be completed by the referrer and the form given to the patient who must present it when having their test done. This test is only available by appointment at specific collection centres at times where medical backup is available if necessary. The phone number to call for an appointment is on the referral form. The consent section of the form is completed by your patient (or guardian) at the collection centre immediately prior to the test being done.

Tests currently available

Aeroallergens (ENV) – allergens 1-9  
Foods (FOD) – allergens 10-16  
Full (FUL) – allergens 1-16

- All patients will also have positive and negative controls recorded.
- No skin prick testing in infants under 6 months of age.
- Patients under the age of 2 years will only have the FOD panel done unless specifically requested.
- If panels are not specified the technicians will make their own decisions according to protocols.

<table>
<thead>
<tr>
<th>Aeroallergens (ENV)</th>
<th>Foods (FOD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. House dust mite (<em>Dermatophagoides pteronyssinus</em>)</td>
<td>10. Soybean</td>
</tr>
<tr>
<td>2. Cat hair</td>
<td>11. Cow’s milk</td>
</tr>
<tr>
<td>3. Dog Hair</td>
<td>12. Egg White</td>
</tr>
<tr>
<td>4. Alternaria (mould)</td>
<td>13. Peanut</td>
</tr>
<tr>
<td>5. Aspergillus</td>
<td>14. Wheat</td>
</tr>
<tr>
<td>7. Perennial Rye (Grass pollen)</td>
<td>16. Fish mix (cod, sole, hake)</td>
</tr>
<tr>
<td>8. Plantain (weed)</td>
<td></td>
</tr>
<tr>
<td>9. Birch mix (White Birch)</td>
<td></td>
</tr>
</tbody>
</table>

Guidelines

The purpose of skin prick testing is to determine whether a patient has detectable IgE antibodies to a specific allergen. Skin tests are considered **positive** if there is a wheal response with a mean diameter of 3mm or greater. The larger the wheal, the more likely it is that the patient will develop symptoms on exposure to that allergen; however, there is no correlation with clinical severity. A **negative** test (zero mm wheal) virtually excludes that allergen as a cause of allergy.

All skin prick tests include a positive and negative control. If the negative control has a detectable wheal response (i.e., not zero mm) this is consistent with dermatographism and other skin test results cannot be interpreted. If the positive control has a negative wheal response (i.e., less than three mm) this is consistent with an antihistaminergic effect and other skin test results cannot be interpreted. In these circumstances, blood tests (EAST/RAST) are preferable.

Allergy is a clinical diagnosis. A patient with a positive skin prick test result who does not have any clinical symptoms on exposure to that substance is sensitized, but not allergic.
In the clinical setting, allergy usually manifests as either an acute allergic reaction or as atopy.

**Acute allergic reaction:**
- Urticaria, angioedema, anaphylaxis
- Usually within 30-60 mins of exposure
- Allergens usually ingested (food, drugs) or injected (venom, drugs), although contact urticaria can occur

**Atopy:**
- Atopic dermatitis (eczema), asthma, allergic rhinitis (hay fever)
- Usually chronic conditions, can worsen acutely
- Allergen(s) can be ingested, inhaled or contacted via skin exposure

Skin testing is **not useful** in the following conditions:
- non specific rashes
- conditions not caused by IgE (coeliac disease, lactose deficiency etc)
- food intolerances (bloating, diarrhea, headaches, fatigue)
- behavioural disorders
- respiratory reactions to irritants (smoke, perfumes, cleaning products etc)
- chronic urticaria

**Safety of skin prick testing**

Anaphylaxis is the most severe potential adverse event, but it is rare. Rates of systemic reactions – not all of which are anaphylaxis – have been estimated at 0.008 to 0.03% in adults. In one study, 5 systemic reactions were reported in 497,656 SPT done in >18,000 patients.

Young children are at greater risk of reaction. Rates of systemic reactions were 0.5% in children under 6 months in one study of >1000 children; all those who reacted had active eczema and were tested to fresh foods rather than commercial extracts. These factors (eczema, under 6 months, and fresh food SPT) all contribute to increased risk. Labtests do not currently do skin prick testing in children under 6 months of age and do not do fresh food skin prick testing in order to reduce these risks.

Only one death has ever been reported with skin prick testing. This was in an adult patient with poorly controlled asthma who was tested with 90 allergens using the old-fashioned scratch technique, which results in exposure to greater amounts of allergens. No deaths have been reported with the current technique.

**Not currently tested at Labtests for safety considerations**

- Children under 6 months
- Pregnant women
- Skin prick testing to fresh foods
- Intradermal testing (drugs, insect venom)

See above for details of increased reaction risk in children under 6 months and those tested with fresh foods. Although adverse reactions to testing are not more likely during pregnancy, an adverse reaction can compromise foetal well-being and even cause miscarriage, and for these reasons blood testing is preferred. Intradermal testing has a significantly higher rate of reaction due to the increased allergen exposure and is only offered in a hospital setting.

**Risk Groups (will be tested)**

- Poorly controlled asthma – will be asked to stay for longer observation period if test(s) positive, due to an increased risk of reaction
- Previous anaphylaxis – will be asked to stay for longer observation period if test(s) positive, although studies do not confirm an increased risk of reaction
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Other concerns

Patients with recent history of anaphylaxis (within 4 weeks) may have false negative results due to the time taken for mast cells to regranulate. Postponing testing is recommended. Patients on beta blockers may be more likely to react and are harder to treat with adrenaline in the event of anaphylaxis. GPs should consider blood testing (EAST/RAST) in this patient group. Labtests do not currently screen for these patients.

When skin testing is uninterpretable

- Patients with dermatographism (negative control will read as positive)
- Patients on medication with antihistamine activity (positive control will read as negative)

These patients should consider blood testing instead.

Alternatives to skin prick testing

Specific IgE testing (EAST, formerly called RAST) on blood samples

Advantages
- More allergens available
- Can do in patients where skin testing is unhelpful (dermatographism, on antihistamines, abnormal skin)
- No risk of systemic reaction

Disadvantages
- Turnaround time
- More expensive
- Less sensitive

Oral challenge testing can be done in hospital settings. Other methods of allergy testing are either experimental (e.g. basophil release assay) or have no scientific basis (e.g. hair testing, muscle testing, IgG antibodies to foods – please see [http://www.allergy.org.au/patients/allergy-testing/unorthodox-testing-and-treatment](http://www.allergy.org.au/patients/allergy-testing/unorthodox-testing-and-treatment) for more information).

Testing in under 2 year olds

Current guidelines from the Australasian Society of Clinical Immunology and Allergy state that skin prick testing in under 2 year olds is a specialist test. Labtests do not offer SPT to children under 6 months for safety reasons, and these patients should be referred to Paediatric Immunology (Starship) if public assessment is required.

In children aged 6 to 24 months, we will test the food panel only, unless there is a specific request for environmental allergens. If these are requested we will do house dust mite, cat and dog.

In most cases, community testing in this age group is for eczema and possible food reactions. Testing for the full environmental allergen screen in eczema is unlikely to be helpful, especially seasonal pollens that the child may not have yet been exposed to. House dust mites and household pet allergen can play a role in eczema, hence their selection for testing.

If additional testing for environmental allergens is thought necessary for a patient in this age group, please discuss with the immunopathologist.

Caution

It is important to consider positive test results in the clinical context. If a patient has a positive test to a food that they can eat without problems, stopping the food may lead to a loss of tolerance and subsequent allergic reactions on re-exposure. Sensitisation to multiple allergens (i.e. positive tests with no reactions on exposure) is particularly common in patients with severe eczema, and significant dietary changes such as long-term exclusion diets on the basis of skin prick testing alone should be discussed with a relevant clinical specialist.

Cross-reactivity may also be misinterpreted; patients with hay fever due to grass pollens commonly have positive skin prick tests to wheat because it is also a grass, but experience no problems eating wheat. Similar findings occur with in
patients with house dust mite allergy who can have cross-reactive positive tests to shrimp. If in doubt, discuss with an immunologist.

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